

Herbs, parasitic and vines of white-sand vegetation “campinarana”

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Photos: Layon O. Demarchi [layon.lod@gmail.com], except images 44 and 72 (by Daniel Praia Portela de Aguiar). Produced by: Layon O. Demarchi with assistance from Valéria Sampaio, Field Museum. Research support from CNPq fellowship, program PELD – MAUA (MCTIC/CNPq/FAPs-GN: 441590/2016-0). Acknowledgements: We also thank the State's Secretary for Environment (SEMA), and the bilateral project Amazon Tall Tower Observatory (ATTO). This study is part of the doctoral thesis of the first author at the INPA.



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1 *Ditassa buntingii*
APOCYNACEAE



2 *Ditassa buntingii*
APOCYNACEAE



3 *Mandevilla arenicola*
APOCYNACEAE



4 *Mandevilla arenicola*
APOCYNACEAE



5 *Mandevilla javitensis*
APOCYNACEAE



6 *Mandevilla javitensis*
APOCYNACEAE



7 *Lepidaploa arenaria*
ASTERACEAE



8 *Lepidaploa arenaria*
ASTERACEAE



9 *Praxelis asperulacea*
ASTERACEAE



10 *Praxelis asperulacea*
ASTERACEAE



11 *Fridericia cf. janshawei*
BIGNONIACEAE



12 *Evolvulus aff. diosmoides*
CONVOLVULACEAE



13 *Evolvulus aff. diosmoides*
CONVOLVULACEAE



14 *Evolvulus aff. diosmoides*
CONVOLVULACEAE



15 *Ipomoea decora*
CONVOLVULACEAE



16 *Ipomoea decora*
CONVOLVULACEAE



17 *Lagenocarpus cf. rigidus*
CYPERACEAE



18 *Lagenocarpus cf. rigidus*
CYPERACEAE



19 *Lagenocarpus cf. rigidus*
CYPERACEAE



20 *Comanthera kegeliana*
ERIOCAULACEAE

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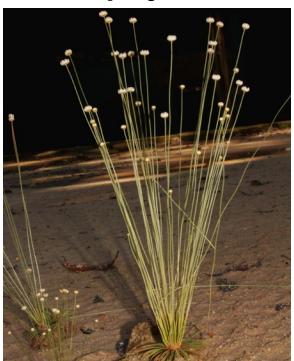
21 *Comanthera kegeliana*
ERIOCAULACEAE



22 *Paepalanthus fasciculatus*
ERIOCAULACEAE



23 *Paepalanthus subtilis*
ERIOCAULACEAE



24 *Syngonanthus tenuis*
ERIOCAULACEAE



25 *Syngonanthus tenuis*
ERIOCAULACEAE



26 *Syngonanthus tenuis*
ERIOCAULACEAE



27 *Syngonanthus williamsii*
ERIOCAULACEAE



28 *Croton dissectistipulatus*
EUPHORBIACEAE



29 *Croton dissectistipulatus*
EUPHORBIACEAE



30 *Croton dissectistipulatus*
EUPHORBIACEAE



31 *Curtia tenella*
GENTIANACEAE



32 *Irlbachia nemorosa*
GENTIANACEAE



33 *Irlbachia nemorosa*
GENTIANACEAE



34 *Roraimaea aurantiaca*
GENTIANACEAE



35 *Roraimaea aurantiaca*
GENTIANACEAE



36 *Gnetum nodiflorum*
GNETACEAE



37 *Cacytha filiformis*
LAURACEAE



38 *Cacytha filiformis*
LAURACEAE



39 *Utricularia triloba*
LENTIBULARIACEAE



40 *Utricularia triloba*
LENTIBULARIACEAE

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Uatumã Sustainable Development Reserve, Amazonas, Brazil

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61 *Dilkea cf. retusa*
PASSIFLORACEAE62 *Dilkea cf. retusa*
PASSIFLORACEAE63 *Passiflora phaeocaula*
PASSIFLORACEAE64 *Securidaca retusa*
POLYGALACEAE65 *Securidaca retusa*
POLYGALACEAE66 *Securidaca retusa*
POLYGALACEAE67 *Securidaca retusa*
POLYGALACEAE68 *Rapatea paludosa*
RAPATEACEAE69 *Rapatea paludosa*
RAPATEACEAE70 *Saxofridericia aculeata*
RAPATEACEAE71 *Saxofridericia aculeata*
RAPATEACEAE72 *Perama dichotoma*
RUBIACEAE73 *Perama dichotoma*
RUBIACEAE74 *Perama hirsuta*
RUBIACEAE75 *Perama hirsuta*
RUBIACEAE76 *Phoradendron crassifolium*
SANTALACEAE77 *Phoradendron crassifolium*
SANTALACEAE78 *Actinostachys pennula*
SCHIZAEACEAE79 *Actinostachys pennula*
SCHIZAEACEAE80 *Schizaea elegans*
SCHIZAEACEAE

Uatumã Sustainable Development Reserve, Amazonas, Brazil

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81 *Smilax sphyilitica*
SMILACACEAE



82 *Smilax sphyilitica*
SMILACACEAE



83 *Abolboda grandis*
XYRIDACEAE



84 *Abolboda grandis*
XYRIDACEAE



85 *Xyris cryptantha*
XYRIDACEAE



86 *Xyris cryptantha*
XYRIDACEAE



87 *Xyris involucrata*
XYRIDACEAE



88 *Xyris involucrata*
XYRIDACEAE



89 *Xyris cf. jupicai*
XYRIDACEAE



90 *Xyris cf. jupicai*
XYRIDACEAE



91 *Xyris uleana*
XYRIDACEAE



92 *Xyris uleana*
XYRIDACEAE



93 *Xyris uleana*
XYRIDACEAE

Uatumã Sustainable Development Reserve, Amazonas, Brazil

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94 Open shrub physiognomy / campina or campinarana arbustiva



95 Open shrub physiognomy / campina or campinarana arbustiva



96 Open forested physiognomy / campinarana florestada



97 Dense forested physiognomy with high groundwater level / campinarana florestada

The white-sand “campinaranas” of the Uatumã SDR are composed of different shrub- and forest formations that occur as fragmented “islands” surrounded by upland “terra-firme” forest. There are striking structural and floristic differences between the different *campinarana* vegetation formations (photos: 80, 81, 82, 83 above), but they share the sandy and very nutrient-poor soils. Sandy soils often have an underlying hardpan that causes superficial inundation through high groundwater levels during the rainy season. *Campinaranas* are relatively open forest formations, where high incidence of solar radiation combined with the low water retention capacity of sandy soils subject plants to seasonal drought during the dry season. *Campinarana* plants need a series of adaptations to cope with these environmental stressors. Although relatively species poor when compared to the surrounding *terra-firme*, *campinaranas* are (therefore) composed of many specialized and endemic taxa.

Special thanks to the taxonomists who helped the identification in specific families: Greta Aline Dettke (Loranthaceae, Santalaceae), Rosângela Simão-Bianchini (Convolvulaceae), Ana Carolina Mezzonato (Passifloraceae), Renato Goldenberg (Melastomataceae), Luiz Otávio Teixeira, Filipe Leite, Thales Coutinho, Francisco Morales, Gessica Fernandes. And also to parataxonomo José Ferreira Ramos and technicians from INPA: Mariana Mesquita, Valdeney Araújo, Elizabeth Rebouças, Celso Rabelo. The ATTO project team for logistics and field support: Nagib Alberto, Amauri Rodriguês, Antonio do Nascimento, André Matos, Wallace Rabelo. And the people who helped in the field: Gildo Feitoza, Maria Julia Ferreira, Gabriel Caldas, Natalia Kinap, Jeisiane Santos da Silva, Gilvan da Silva Costa, Adriano Quaresma, Anderson Reis, William Bercê.